PROGRAMMING

This decoder supports all program modes and read back features. With MRC Prodigy Advance DCC you can read its address and CV value.

PROGRAMMING

CV | Register | Description | Range | Default
---|---|---|---|---
CV1 | R1 | Short address | 1-127 | 3
CV2 | R2 | Start voltage | 0-32 | 0
CV3 | R3 | Acceleration | 0-32 | 0
CV4 | R4 | Deceleration | 0-32 | 0
CV5 | Top voltage | 0-32 | 32
CV6 | Speed curve selected (0=linear) 1=slow increase 2=fast increase at slow speed | 0-2 | 0
--- | --- | --- | --- | ---
CV29 | R5 | Basic configuration | --- | 2
CV7 | R7 | Manufacturer version number | --- | 32
CV8 | R8 | Manufacturer ID | --- | 143
CV9 | --- | Long address upper byte | 160-255 | 192
CV10 | --- | Long address lower byte | 0-255 | 3
CV11 | --- | Advanced consist address | 0-127 | 0
CV21 | --- When CV21=0, functions follow its own address CV21=1, functions follow the consist address | --- | 1
CV64 | --- Sound on/off except horn that is always on | 0-1 | 1
CV65 | --- Sound on/off except horn that is always on | 0-1 | 1
CV66 | --- Horn type (34 types) | 0-33 | 4
CV67 | --- Horn volume | 0-3 | 0
CV68 | --- Bell type (8 types) | 0-7 | 3
CV69 | --- Bell volume | 0-3 | 0
CV70 | --- Bell ring rate | 0-30 | 3
CV71 | --- Diesel rumble volume | 0-3 | 0
CV72 | --- Brake squeal volume | 0-3 | 0
CV73 | --- Dynamic brake volume | 0-3 | 0
CV74 | --- Air relief volume | 0-3 | 0
CV75 | --- Air pump volume | 0-3 | 0
CV76 | --- Safety pop valve volume | 0-3 | 0
CV77 | --- Engine cooling fan volume | 0-3 | 0
CV78 | --- Coupling volume | 0-3 | 0
CV79 | --- Auto dial lights flash with horn enable | 0-1 (enable) | 0
CV80 | --- Rail wheel clack | 0-3 | 0
CV81 | --- Kick start voltage | 0-63 | 63
CV97 | --- 2S speed steps table CV69-A1 | 1-255 | linear
CV105 | --- User identification number | 0-255 | 0
CV106 | --- User identification number | 0-255 | 0
CV113 | --- Coupling fire volume | 0-3 | 0
CV114 | --- Brake release pressure volume | 0-3 | 0
CV115 | --- Auto brake release enable/disable | 0-1 (enable) | 0
CV116 | --- Auto bell with horn enable | 0-1 | 0 (disable)
CV117 | --- Light mode, Normal headlight 1=front light, bright at night cycle 2=rule 17 | 0-2 | 0
CV118 | --- ACC1 light mode | 0-6 | 0
CV119 | --- ACC2 light mode | 0-6 | 0
CV121 | --- Ditch flash (11) or stay on (10) | 0-1 | 0
CV122 | --- Notch mode, Slow, 3manual | 0-3 | 0
CV123 | --- Prime mover type (3=diiesel off) | 0-2 | 0
CV124 | --- Back emf load control on/off | 0-1 | 0 (off)
CV125 | --- Programming to "1" will restore some CVs to factory settings | --- | 0

SPEED TABLE CV67-CV94 FOR 28 SPEED STEPS

When CV29's bit 4 is set to "1" it will use the speed table formed by CV67-CV94 to control speed (motor voltage). It allows you to setup each speed for all 28 speed steps. First, program CV29 to 18 for short addresses (1-127) or if program CV29 to 59 for long addresses (128-9999) to enable speed control. Then select throttle to 28 speed steps and run your loco at speed step 1. Use program CV on the main to change CV67's value (1-255) to adjust step 1's speed. The kick voltage, CV65 is only applied when the speed steps change from 0 to 1. You should switch between 0 to 1 many times to check step 1's speed. When done with CV19, select speed step 2 and program CV68. CV68's value must be greater then CV67's. When done with CV19, select speed step 4 and program CV68, CV68's value must be greater then CV67's. With MRC Prodigy, you can read back CV65 to make sure their values are in increasing order.

Program top voltage CV5 to 31. You should also clean the track to improve momentum by reprogramming CV3 and CV4 to zero. If its top speed is too slow, you should program top voltage CV5 to 31. You should also clean the track to improve electrical pickup. Read your DCC system manual to learn how to program and operate the decoder. For more information about registers/CVs and their functions, please refer to the NMRA DCC Standard & Recommended Practices, RP-9.2.2. This is available directly from the NMRA or their website at www.nmra.org. Whenever the decoder doesn't work please use the program track to program CV125 with value 1 to restore the decoder to factory settings. This should bring the decoder to life with address #3.

Trouble shooting

This decoder should perform well with all DCC systems. The maximum DCC output should be less than 21 V. If the locomotive does not respond to commands it may have lost its address. Please re-program the address and program CV19 to 0 (disable consist). If it responds to slowly, you should clean its moment by reprogramming CV3 and CV4 to zero. If step 1's speed is too high, you should program top voltage CV5 to 0. If its top speed is too slow, program top voltage CV5 to 31. You should also clean the track to improve electrical pickup. Read your DCC system manual to learn how to program and operate the decoder. For more information about registers/CVs and their functions, please refer to the NMRA DCC Standard & Recommended Practices, RP-9.2.2. This is available directly from the NMRA or their website at www.nmra.org. Whenever the decoder doesn't work please use the program track to program CV125 with value 1 to restore the decoder to factory settings. This should bring the decoder to life with address #3.

RETURN PROCEDURE

If it should become necessary to return your decoder, unplug the decoder and return the decoder only. Include a letter (printed clearly) with your name, address, a daytime telephone number, and a detailed description of the problem you are experiencing. Please include a $15.00 check to cover shipping and handling. Be certain to return the decoder only.

Warranty does not include abuse, neglect, or using this product for any purpose other than it’s intended purpose. Warranty coverage will be handled on a case by case basis, and other charges may apply for repair/replacement of the product.

Send the decoder to:
Model Rectifier Corporation
Attn: Parts & Service
80 Newfield Avenue
Edison, NJ 08837-3817 U.S.A
INSTALLATION
It is quite a challenge to install the decoder in your loco. You should have some basic electrical knowledge. If you do not have, please ask the dealer for help in installation.

Figure 1 shows the electrical circuit of most standard locos. The terminals of the motor and lights are directly connected to the wheel pickup. Each type of loco has its own method of electrical pickup and distribution. There is no standard rule for installing decoders. It is always better to consult the loco manufacturer on how to install a decoder in your particular loco. First, figure out your loco’s electrical wiring and how to disconnect (isolate) the motor and light(s). Label all wires before you disconnect them.

Figure 1. Connection of standard locomotive.  Note: The ‘X’ marks indicate where to disconnect (isolate).

Right side pickup

<table>
<thead>
<tr>
<th>Common</th>
<th>Headlight</th>
<th>Right light</th>
<th>Rear light</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motor</td>
<td>Headlight</td>
<td>Right light</td>
<td>Rear light</td>
</tr>
<tr>
<td>Headlight</td>
<td>Common</td>
<td>Headlight</td>
<td>Right light</td>
</tr>
<tr>
<td>Front light</td>
<td>Rear light</td>
<td>Front light</td>
<td>Rear light</td>
</tr>
</tbody>
</table>

Left side pickup

<table>
<thead>
<tr>
<th>Common</th>
<th>Headlight</th>
<th>Left light</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motor</td>
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<td>Common</td>
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</tr>
<tr>
<td>Front light</td>
<td>Left light</td>
<td>Front light</td>
</tr>
</tbody>
</table>

TESTING
The decoder has been programmed to address #3. 26128 speed steps. To test, place the loco on the test track. Select address #3 and 8 speed step. Move up the throttle and the loco should move. Push the light button [F0] and headlight should come on. Change the direction of the loco and the loco should change direction. The loco cannot reach full speed, due to the resistor. If all the above occurs, you passed the test. Congratulations! Do not run the loco for an extended period of time on the test track or the resistor will overheat. If your installed decoder does not pass the test, find the problem, correct it and test it again. As long as you test the decoder on the test track there is little chance of damaging the decoder. This is why the test track is so important.

OPERATION
The decoder has start up and shut down features. If the loco was previously shut down you have to start up the engine. Press any function key to start up the engine before operating the loco. To shut down the engine you must bring the loco to idle and then press F8 three times. Double click F0 will turn on/off sound (CV49). You can’t turn off horn which is always on. The decoder has two types of diesel prime movers. You can use F12 to select them or select diesel off (CV121). So it can be used in an Electric Type. The decoder has start up and shut down features. If the loco was previously shut down you have to start up the engine. To shut down the engine you must bring the loco to idle and then press F8 three times.

LIGHT EFFECT PROGRAMMING CHART FOR CV118/119
Program CV117 to choose 3 different modes of headlight effects (0=normal directional, 1=off/dim/bright cycle, 2=rule 17). Both ACC1 and ACC2 has 7 different accessory lights effects. Program CV #116/118 to choose the desired light effect. CV118 for ACC1 and CV119 for ACC2. For ditch light both CV118 and CV119 must be 0 in ditch light mode, use F3 to turn on/off and use F28 to enable/disable flash light. When you blow the horn the ditch lights will flash. The ditch lights will remain flashing for several seconds after horn is off.

MAKING A TEST TRACK
We strongly recommend building a test track with a 27 ohm resistor to limit current. Only test your installed decoder on the test track. The track will reduce the chance of damaging your decoder due to an incorrectly installed decoder.

Figure 2. How to wire the decoder.

The decoder will be inserted between the wheel pickup and the motor. After disconnecting the motor terminals from the pickup, connect the right side pickup wires to the green terminal # 1 and connect the left side pickup wires to the green terminal # 4. Connect the right motor terminal to the green terminal # 2. Connect the left motor terminal to the green terminal # 3. The wires must be stripped 5 mm and well twisted and tinned with solder before you connect them to the green terminals. Make sure there is no short circuit among these four terminals. Connect the front and rear lights to the headlight output. The middle terminal is common. Connect the accessory lights to the accessory output. Again the middle terminal is common. Use double-sided sticky tape to place the decoder in a safe place. The decoder can’t touch any metal part or bare wires. The 40 mm speaker should have an enclosure made for a better sound quality.

If you have a 1.5V bulb or LED, you should connect a 2k ohm resistor in series to one of the leads to limit current.

Figure 2. 0001818 decoder wiring diagram

Note: Bell, Dynamic Brake, and Rail Wheel Clack cannot play at the same time.